Space Weather Forecast

Issued on Tuesday, 27 August 2024 at 12:45 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: M-class flares and R1/R2 blackouts likely. Slight chance of G1 Minor Storm intervals Day 1 (27 Aug) from CME arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was Moderate over the past 24hrs, with a single moderate class flare, peaking at M1.1 at 27/0943 UTC from a large region in the southwest.

There are ten sunspot regions on the visible disc. The most notable flare source remains the region located in the southwest quadrant. There is another large region near south centre disc but it is mostly inactive and unchanged. One of the regions is now approaching the southwest limb and should soon rotate onto the far side whereas magnetic looping in the east indicates the proximity of a returning region. The remaining regions are either small or magnetically simple and mostly stable.

A Coronal Mass Ejection (CME) was observed emerging off the southeast disc at around 26/1830 UTC. While dimming was detected, there was no evidence of any flare or filament lift-off associated with this event, leading us to believe that it was most likely far-sided. No Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: The solar wind parameters indicate that a CME arrived at L1 (Lagrange point) at around 27/0735 UTC, most likely the one that left the Sun on 23 Aug. The solar wind speed increased from 250 to 320 km/s. The Interplanetary Magnetic Field (IMF) became moderate, the important north-south component starting to show a more erratic behaviour. Resulting geomagnetic activity was mostly Quiet (Kp 0-2) with a couple of Unsettled intervals at the end of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate class flares are expected with a slight chance of isolated Strong flares.

Solar Wind /Geomagnetic Activity: The CME that was seen leaving the sun on 23 August is believed to have arrived at L1 early this morning but impacts on the geomagnetic activity are expected to be limited, with only a few Unsettled to Active intervals and a slight chance of an M1 Minor Storm on Day 1 (27 Aug). No other Earth-directed CMEs are expected.

The fast speed stream associated with CH62 and perhaps CH63 may slightly enhance the solar wind speed late on Day 2 or early on Day 3 (28-29 Aug) but again, geomagnetic activity is expected to be mostly Quiet with perhaps the odd Unsettled interval. Largely Quiet activity on

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Day 4.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background, but there is a chance of this rising in response to any notable flares, especially from the regions in the western disc. This gives a slight chance of exceeding the S1 Minor Solar Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

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Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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